Abstract

A neutron detection device includes a neutron conversion layer in close proximity to an active semiconductor layer. The device is preferably based on the modification of existing conventional semiconductor memory devices. The device employs a conventional SRAM memory device that includes an SOI substrate. The SOI substrate includes an active semiconductor device layer, a base substrate and an insulating layer between the active semiconductor device layer and the base substrate. The base substrate layer is removed from the memory device by lapping, grinding and/or etching to expose the insulating layer. A neutron conversion layer is then formed on the insulating layer. The close proximity of the neutron conversion layer to the active semiconductor device layer yields substantial improvements in device sensitivity.